

Fortran For the Nineties

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J.T. Himer

Fortran has largely enjoyed prominence for the past few decades as the computer programming language of choice for numerically intensive scientific, engineering, and process control applications. Fortran's well understood static language syntax has allowed resulting parsers and compiler optimizing technologies to often generate among the most efficient and fastest run-time executables, particularly on high-end scalar and vector supercomputers.

Computing architectures and paradigms have changed considerably since the last ANSI/ISO Fortran release in 1978, and while FORTRAN 77 has more than survived, its aged features provide only partial functionality for today's demanding computing environments. The simple block procedural languages have been necessarily evolving, or giving way, to specialized supercomputing, network resource, and object-oriented paradigms.

To address these new computing demands, ANSI has worked 12-years with three international public reviews to deliver Fortran 90. Fortran 90 superseded and replaced ISO FORTRAN 77 internationally recently as the sole Fortran standard; while domestically in the US, Fortran 90 is expected to be adopted as the ANSI standard this summer, coexisting with ANSI FORTRAN 77 until at least 1996.

The development path and current state of Fortran will be briefly described highlighting the many new Fortran 90 syntactic and semantic additions which support (among others): free form source; array syntax; new control structures; modules and interfaces; pointers; derived data types; dynamic memory; enhanced I/O; operator overloading; data abstraction; user optional arguments; new intrinsics for array, bit manipulation, and system inquiry; and enhanced portability through better generic control of underlying system arithmetic models. Examples from dynamical astronomy, signal and image processing will attempt to illustrate Fortran 90's applicability to today's general scalar, vector, and parallel scientific and engineering requirements, and object oriented programming paradigms.

Time permitting, current work proceeding on the future development of Fortran 2000 and collateral standards will be introduced.